

What is claimed is:

1. A transmitter for use in a network carrying a plurality of data bits, said transmitter comprising:

a physical layer;

a first link layer;

5 means for providing at least a subset of said plurality of data bits;

means for making said first link layer match a second link layer in a handheld device;

means for making said at least said subset of said plurality of data bits available to said first link layer;

10 means for making said at least said subset of said plurality of data bits available to said first physical layer;

means for generating a signal comprising said at least said subset of said plurality of data bits; and

15 means for transmitting said signal to said handheld device in a format compliant with and receivable by said second link layer.

2. The transmitter of claim 1 wherein said matching first and second link layers are infrared data association (IrDA) compliant.

3. The transmitter of claim 1 wherein said means for transmitting said signal includes:

an on-interval;

an off-interval;

5 said on-interval corresponding to the presence of at least a portion of at least one
of said at least said subset of said plurality of data bits;

 said off-interval corresponding to the absence of any of said at least said subset of
said plurality of data bits; and

 said on and said off intervals further arranged such that a communication interface
10 associated with said handheld device may communicate with another handheld device
when said off-interval is present at said communication interface.

4. The transmitter of claim 3 wherein said handheld device is capable of receiving
infrared data signals.

5. The transmitter of claim 4 wherein said communication interface is compliant
with an infrared-data-association (IrDA) specification.

6. The transmitter of claim 5 wherein said first link layer is compliant with an
infrared-data-association (IrDA) specification.

7. The transmitter of claim 2 wherein said signal is an infrared signal.

8. The transmitter of claim 7 wherein said signal is a diffuse infrared signal.

9. The transmitter of claim 8 wherein said signal has a wavelength in the range of substantially 850 nanometers to 1250 nanometers.
10. The transmitter of claim 9 wherein at least a portion of said signal is comprised of an XML element.
11. The transmitter of claim 9 wherein said signal is generated by modulating an electric light.
12. A handheld device for receiving a unidirectional infrared transmitted signal containing a message over a communication medium, said handheld device comprising:
- a physical layer;
 - a link layer;
 - means for receiving said transmitted signal to form a received signal;
 - means for passing said received signal to said physical layer;
 - means for passing said received signal from said physical layer to said link layer;
- and
- means for utilizing information contained in said received signal to accomplish a task.
13. The handheld device of claim 12 wherein said receiving means is a bi-directional infrared communication interface.

14. The handheld device of claim 13 wherein said transmitted signal is a diffuse infrared signal.
15. The handheld device of claim 14 wherein said transmitted signal is conveyed in a format compatible with said physical layer and said link layer.
16. The handheld device of claim 15 wherein said physical layer and said link layer are infrared-data-association (IrDA) compliant.
17. The handheld device of claim 16 wherein said transmitted signal includes a broadcast XML element containing said information.
18. The handheld device of claim 17 wherein said transmitted signal contains an integrity XML element encapsulating said broadcast XML element.
19. The handheld device of claim 18 wherein said receiving means is an infrared-data-association (IrDA) compliant communication interface.
20. The handheld device of claim 19 wherein said transmitted signal comprises an on-interval corresponding to the presence of said transmitted signal at said receiving means and an off-interval corresponding to the absence of said transmitted signal at said receiving means, said on-interval and said off-interval being separated by an interval of

5 time, said on-interval further conveying at least a portion of said transmitted signal to said receiving means.

21. The handheld device of claim 20 wherein said link layer can accommodate a signal containing less than an entire message during said on-interval.

22. The handheld device of claim 19 wherein said transmitted signal includes a first on-interval, a first off-interval occurring immediately after said first on-interval, a second on-interval occurring immediately after said first off-interval and a second off-interval occurring immediately after said second on-interval.

23. The handheld device of claim 22 wherein said link layer can accommodate said received signal when a portion of said message is present during said first on-interval and the remainder of said message is present during said second on-interval.

24. A method of utilizing executable code in a handheld device comprising the steps of:

receiving a signal at a physical layer communicatively associated with a communication interface to form a received signal;

5 passing said received signal from said physical layer to a link layer;
extracting information contained in said received signal; and
making said information available to a user of said handheld device.

25. The method of claim 24 wherein said communication interface is an infrared-data-association (IrDA) compliant interface.

26. The method of claim 25 wherein said received signal is obtained from a transmitter having a emitter link layer.

27. The method of claim 26 wherein said emitter link layer is compatible with said link layer.

28. The method of claim 27 further including a plug-in, said plug-in for performing said extracting step and said making step.

29. A method of utilizing executable code in a source device to convey a plurality of bits to a handheld device having a communication interface and a first link layer, said method comprising the steps of:

formatting said at least a subset of said plurality of bits into a data signal;

5 making said data signal available to a second link layer compatible with said first link layer;

receiving said data signal at a second physical layer; and

making said data signal available to a transmitter for conveying to said communication interface;

10 whereby said at least a subset of said plurality of bits is conveyed to said handheld device.

30. The method of claim 29 wherein said communication interface is infrared-data-association (IrDA) compliant.

31. The method of claim 30 wherein said data signal is an infrared signal.

32. The method of claim 31 wherein said data signal is a diffuse infrared signal.

33. The method of claim 32 wherein said data signal contains an XML element.

34. A unidirectional computer-readable data signal for modifying the operation of a handheld device having an infrared-data-association (IrDA) compliant communication interface, said data signal comprising:

machine-readable information encoded in an infrared-data-association (IrDA)

5 compliant format for processing by said handheld device, said information having been received from a diffuse infrared transmitter conveying said data signal; and

whereby said operation of said handheld device is modified upon processing said information.

35. The computer-readable data signal of claim 34 wherein said communication interface is a bi-directional communication interface.

36. The computer-readable data signal of claim 35 wherein said information is comprised of XML elements.

37. The computer-readable data signal of claim 36 wherein said information is processed by a plug-in running on said handheld device.

38. The computer-readable data signal of claim 34 wherein said diffuse infrared transmitter further includes an infrared-data-association (IrDA) compliant link layer.

39. The computer-readable data signal of claim 34 wherein said diffuse infrared transmitter generates said data signal by modulating an electric light.

40. A computer-readable data signal generated by a transmitting device for modifying the operation of a handheld device, said data signal comprising:

machine-readable information obtained from at least a subset of a plurality of bits making up said data signal, said information organized into an infrared-data-association

5 (IrDA) compliant format by interacting with a first link layer in said transmitting device before transmission as a diffuse infrared signal, said information for modifying the operation of said handheld device upon interacting with a second link layer in said handheld device.

41. The computer-readable data signal of claim 40 wherein said first link layer and said second link layer are of the same type.

42. The computer-readable data signal of claim 40 wherein said machine-readable information includes an XML element.

43. A method for conveying at least a subset of a plurality of data bits from a transmitter to a handheld device, said method comprising the steps of:

making a first link layer in said transmitter match a second link layer in said handheld device;

5 providing said at least said subset of said plurality of data bits;

making said at least said subset of said plurality of data bits available to said first link layer;

receiving said at least said subset of said plurality of data bits at a first physical layer in said transmitter;

10 generating an infrared signal comprising said at least said subset of said plurality of data bits; and

conveying said infrared signal to a communication interface associated with said handheld device in a format compliant with and receivable by said second link layer;

15 whereby at least said subset of said plurality of data bits is conveyed to said handheld device.

44. The method of claim 43 wherein said communication interface is a bi-directional communication interface.

45. The method of claim 44 wherein said matching first and second link layers are infrared-data-association (IrDA) compliant.

46. The method of claim 45 wherein said communication interface is an infrared-data-association (IrDA) compliant communication interface.

47. The method of claim 46 wherein said infrared signal is a diffuse infrared signal having a wavelength in the range of substantially 850 nanometers to 1250 nanometers.

48. The method of claim 43 wherein said infrared signal includes:
an on-interval;
an off-interval;
said on-interval corresponding to the presence of at least a portion of one of said
5 at least said subset of said plurality of data bits;
said off-interval corresponding to the absence of said at least said subset of said
plurality of data bits; and
said on-interval and said off-interval further arranged such that said
communication interface can transmit an IrDA-compliant-signal when said off-interval is
10 present at said communication interface.

49. A method of receiving a unidirectional-infrared-data-signal from a transmitter comprising:
receiving said data signal at a communication interface to form a received signal;

passing said received signal from said communication interface to a physical

5 layer;

making said received signal available to a link layer; and

utilizing information contained in said received signal to accomplish a task.

50. The method of claim 49 wherein said communication interface is a bi-directional communication interface.

51. The method of claim 50 wherein said communication interface is an infrared-data-association (IrDA) compliant communication interface.

52. The method of claim 51 wherein said data signal is a diffuse infrared signal.

53. The method of claim 52 wherein said data signal contains a message.

54. The method of claim 53 wherein said data signal is comprised of an on-interval corresponding to the presence of said data signal at said communication interface and an off-interval corresponding to the absence of said data signal at said communication interface, said on-interval and said off-interval separated by an interval of time, said on-

5 interval further conveying at least a portion of said data signal to said physical layer.

55. The method of claim 54 wherein said link layer can accommodate said received signal containing only a portion of said message during said on-interval.

56. The method of claim 53 wherein said data signal includes a first on-interval, a first off-interval occurring immediately after said first on-interval, a second on-interval occurring immediately after said first off-interval and a second off-interval occurring immediately after said second on-interval.

57. The method of claim 56 wherein said link layer utilizes said received signal when a portion of said message is present during said first on-interval and the remainder of said message is present during said second on-interval.